# Grade 5 - Unit F- Geometry and Coordinate Graphing

## Unit Focus

In this unit, students encounter several new geometric concepts. Coordinate graphing in the first quadrant is formally introduced. Students learn how to identify and plot coordinates using the x- axis and y-axis. They also begin to look at patterns represented by graphing on a coordinate grid. In addition, the use of hierarchies to classify two-dimensional shapes by their properties is presented. Specifically students study triangles and quadrilaterals. When classifying 2-D shapes, students understand that while the properties that belong to a category of two-dimensional figures also belong to all the subcategories, the reverse is not true.

## Stage 1: Desired Results - Key Understandings

### Standard(s)

**Standards**

- Common Core
  - *Mathematics: 5*
    - Analyze patterns and relationships.
    - Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule Add 3 and the starting number 0, and given the rule Add 6 and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so. *(CCSS.MATH.CONTENT.5.OA.B.3)*
    - Graph points on the coordinate plane to solve real-world and mathematical problems.
    - Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate). *(CCSS.MATH.CONTENT.5.G.A.1)*
    - Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. *(CCSS.MATH.CONTENT.5.G.A.2)*
    - Classify two-dimensional figures into categories based on their properties.

### Transfer

*Students will be able to independently use their learning to...*

**T1** Construct viable arguments using clear and appropriate mathematical language and critique the reasoning of others.

**T2** Identify and generalize patterns and structure in numbers, expressions, data and objects.

### Meaning

| Understanding(s) | Essential Question(s) |
|---|---|
| *Students will understand that...*<br>**U1** Mathematicians construct viable arguments to explain problems, solutions, and mathematical representations.<br>**U2** Mathematicians see patterns to make generalizations about structures and relationships. | *Students will keep considering...*<br>**Q1** How can I strengthen my argument and reasoning?<br>**Q2** What generalizations can be made from this pattern?<br>**Q3** Why do we classify geometric shapes and objects?<br>**Q4** How can I understand and use information presented on a coordinate plane? |

### Acquisition of Knowledge and Skill

| Knowledge | Skill(s) |
|---|---|
| *Students will know...*<br>**K1** The properties of polygons.<br>**K2** How to plot coordinates on a grid.<br>**K3** How to name polygons based on characteristics. | *Students will be skilled at...*<br>**S1** Describing the properties and characteristics of a triangle<br>**S2** Describing the properties and characteristics of a quadrilateral |

## Stage 1: Desired Results - Key Understandings

| | | |
|---|---|---|
| ▪ Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles. *(CCSS.MATH.CONTENT.5.G.B.3)*<br>▪ Classify two-dimensional figures in a hierarchy based on properties. *(CCSS.MATH.CONTENT.5.G.B.4)*<br>▪ Mathematical Practices<br>▪ Construct viable arguments and critique the reasoning of others. *(CCSS.MATH.MP.3)*<br>▪ Look for and make use of structure. *(CCSS.MATH.MP.7)*<br><br>**Madison Public Schools Profile of a Graduate**<br>o Analyzing: Examining information/data/evidence from multiple sources to identify possible underlying assumptions, patterns, and relationships in order to make inferences. *(POG.1.2)*<br>o Product Creation: Effectively use a medium to communicate important information. *(POG.3.2)* | **K4** The hierarchy of polygons as defined by given characteristics.<br>**K5** Vocabulary: coordinate, coordinate plane, ordered pair, point, x-axis, y-axis, sequence, arrangement, polygon, quadrilateral, square, rectangle, rhombus, trapezoid, hierarchy, acute angle, acute triangle, angle, equilateral triangle, isosceles triangles, obtuse triangle, property, classify, right angle, right triangle, congruent, irregular polygon, regular polygon, parallel, parallelogram, sub category, kite, hexagons, pentagon, length, width, patterns | **S3** Justifying the classification of certain polygons<br>**S4** Plotting coordinates on a grid<br>**S5** Naming coordinates from a grid |